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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,287	04/20/2004	Koji Mishima	2004_0611	2623

513 7590 04/05/2006

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SUITE 800
WASHINGTON, DC 20006-1021

EXAMINER

LEADER, WILLIAM T

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/827,287

Applicant(s)

MISHIMA ET AL.

Examiner

William T. Leader

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Receipt of the papers filed on January 6, 2006, is acknowledged.
2. In the Remarks, applicant states that U.S. patent 6,632,335 to Kunisawa et al and the instant invention were at the time the instant invention was made, subject to an obligation of assignment to Ebara Corporation and Kabushiki Kaisha Toshiba, and accordingly the Kunisawa et al patent is not available as prior art insofar as the 35 U.S.C. 1039a) rejection of record is concerned.
3. In view of applicant's statement, the rejection of record based in part on the Kunisawa et al patent is withdrawn.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

5. Claims 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Talieh (6,676,822) combined with Ashjaee et al (6,482,307), both of record, and Walker (6,364,749) newly cited.
6. Talieh and Ashjaee et al are applied as in the previous office actions. As previously indicated, the Talieh patent is directed to a method for electrochemical deposition of a metal onto a semiconductor wafer. As shown in figures 1A and 1B, the wafer is positioned to face anode 30. A pad 32, which corresponds to the liquid impregnation material recited in claim 5, is

positioned between the anode and wafer. A plating liquid is supplied through openings in the anode plate to the pad. A cathode contact 28 provides plating current to the wafer. As shown in figure 1A, both the wafer and pad rotate. The widths of the pad 32 and supporting portion of the anode are smaller than the diameter of the wafer. Consequently, as the pad and wafer rotate, the central portion of the surface of the substrate faces the anode for a longer time than the outer peripheral portions. Talieh discloses the deposition of a layer of metal on the face of a semiconductor wafer over a barrier/seed layer (column 1, lines 16-20). Talieh additionally discloses that the metal is deposited into trenches (column 1, lines 27-31)

7. Claim 5 differs from the process of Talieh by reciting that a gap is formed between the substrate and the plating liquid impregnation material and that electric current is applied without bringing the substrate into contact with the plating liquid impregnation material. The Ashjaee et al patent is directed to a method for electroplating and electropolishing semiconductor wafers. As shown in figure 4, pad 8, which corresponds to applicant's liquid impregnation material, is disposed between an anode and semiconductor wafer 22. A gap 34 between the pad 8 and the wafer 22 is provided. This gap corresponds to the gap now recited by applicant. Ashjaee et al teach that gap 34 may be adjusted so that one can achieve just plating, or plating and polishing.

8. Claim 5 additionally differs from the process of Talieh by reciting that the liquid impregnation material comprises a porous ceramic. In the specification, applicant indicates that porous ceramics include alumina and SiC. The Walker patent is directed to a CMP polishing pad. Walker teaches that the pad may comprise a urethane-cake material which includes

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abrasives such as silica or alumina. See column 6, lines 36-60. Thus, Walker discloses a polishing pad comprising a porous ceramic.

9. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have provided a gap between pad 32 and the wafer of Talieh as taught by Ashjaee et al because plating without polishing in addition to plating and polishing would have been performed. It would additionally have been obvious to have utilized a polishing pad comprising a porous ceramic such as silica because such as provide effective polishing as taught by Walker.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



William Leader
March 29, 2006



ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700